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ol. 34 No. 1

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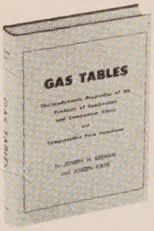

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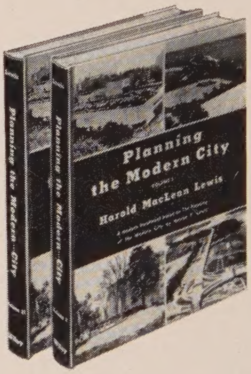

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PROFESSIONAL ENGINEER

"The Voice of the Engineer"

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M. E. McIVER, Editor

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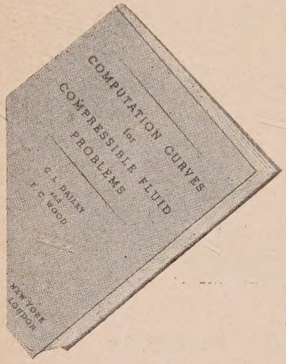
COMPUTATION CURVES FOR COMPRESSIBLE FLUID PROBLEMS

By C. L. Dailey and F. C. Wood

January
1949



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April 1949
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1849 *1949*

THERE'S GOLD IN THOSE HILLS

REMEMBER that familiar quotation of the old Forty-Niners? We know they looked upon 1849 as THE YEAR with the same religious fervor as old Adolph the Paperhanger looked upon Der Tag.

Well, the Forty-Niners you have selected to lead A.A.E. for another year believe that the gold is still there in 1949.

They are not referring to gold in the sense of a medium of exchange, or something to worry about causing excessive income taxes, etc. They refer to Engineers, who still believe in an Ideal and are hard headed and stubborn enough to believe that that Ideal is tangible and real and must succeed.

"Yes, but how?" you ask, and the answer is simple, but not easy. If the way was easy it would not have been given to an Engineer and hard tasks are just the right thing to give an Engineer. If you wanted an easy "feather bed" job you would not have studied Engineering but you did graduate and you received your degree.

While at school did you belong to your Student Chapter of A.A.E. and help to make it a success? If not, what kind of an Engineer did you expect to become after graduation? If you had worked for your Student Chapter of A.A.E. you would have developed a sense of Leadership that would have helped you to understand the problems of your fellow classmates. This sense would have helped you to work out your assigned duties in an Engineering establishment.

You would have strived just a little harder than the other fellow to work out your problems and, unsuspectedly at first, would have taken a keener interest in Labor Relations. This interest would not remain unnoticed because the great Industrialists look upon Engineers for absolutely fair decisions and Labor, likewise, knows that an Engineer will always do his utmost to give them a fair deal.

Now you are out of school a few years, did you apply for Registration in the State wherein you reside? If not—why? You spent years at school to become a member of a world famous Profession and couldn't take enough time to gain that cherished License. What would you think of a Medical graduate who did not pass his State Board and hang that License in his office? Would you be willing to trust your life or that of your loved ones to a Doctor without a license?

You are working now but did you transfer to a higher grade of membership in A.A.E.? If not—why? It helped you to develop your own talents in school and didn't you have enough faith to carry on?

Were you a timid Casper Milquetoast, or were you a self-satisfied egotist who thought he had the world by the tail and could not do something that might help his Profession?

Well, you still need A.A.E. and A.A.E. needs you if you are willing to fight for an Ideal. When I speak of fighting I do not mean you are to make yourself obnoxious to your employer or to your fellow workers. No one likes a grumbler, kicker or perpetual obstructionist, and there is no place for that in Engineering. However, you can fight for your Ideal and for your Profession in a manner that will bring glory to Engineering, to A.A.E., and to yourself. How? Well, that's easy, too.

Do your work a little more thoroughly than the other fellow and do a little more than is expected of you.

If your superior gives you instructions, listen to him instead of telling him how you could do it better and more easily.

Why? Because you are a member of A.A.E. and "Cooperate" and "Advance" means something real to you.

Don't imagine yourself to be the policy maker for your firm before you have earned that right by hard work.

You think *of the Boss now* and maybe, later on, he will let you think *for him.*

Well, do you agree with me and are you helping A.A.E., or are you going to develop into a self-satisfied snob?

For a bigger and better A.A.E.—

Your President

Edmund J. Fitzmaurice

Technologists can be

A DYNAMIC UNIT FOR CIVIL SERVICE

The Council's Greatest Opportunity

By H. A. WAGNER, Past Pres. A.A.E.
Director, Chicago Technical Societies Council

Throughout Chicagoland, there is a tremendous amount of live power which must be harnessed, concentrated and directed, before it can be efficiently used for the good of this vast community and the nation. That power, of course, is the knowledge, judgment, and patriotism of thousands upon thousands of highly trained, intelligent technologists who do not now, as an entity, bear their fair share of civic responsibility. Individuals stand out from the mass by virtue of their active participation in civic affairs; small groups, bestirred by special issues, may occasionally be activated; but the great numbers of technologists have never achieved standing as an identifiable unit, as a special segment of society, capable of performing great service for which their training peculiarly fits them.

If the Chicago Technical Societies Council could give technologists such an identity, and could unify them in public service, it would merit the unqualified support of every technologist and of every technical society in this region.

Not a Pressure Group

Let it be clearly understood that the Council, in thus unifying technologists, should not be just another pressure group. It should not serve the purposes of those who believe that technologists must organize to "throw their weight around" and to wrest special privileges or rewards for architects, chemists, engineers and other industrial scientists. Outstanding public service brings recognition, and this almost inevitably insures improvement in material rewards. In organizing for public service, technologists may be motivated both by an honest desire to carry their collective civic responsibilities creditably and an intent to gain recognition for their day by day contribution to social welfare, that will result in greater material rewards for their service to society. The two motives are not inconsistent, but public service should be the primary aim. If this motive is subordinated to self-interest, the Council might easily become another ruthless pressure group.

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*This article was prepared for and published in the August 1948 issue of "Sci-En-Tech News," official publication of the Chicago Technical Societies Council, and reprinted in PROFESSIONAL ENGINEER by request, for the benefit of other engineering councils, societies and engineers in general. It will be of special interest to the members of the American Association of Engineers, because it emphasizes the activities of the Association. Comments are solicited.

We need only observe the hornet's nest of retaliation stirred up by selfish factions, to know that groups which ignore public welfare and seek disproportionate rewards ultimately defeat their own aims. Technologists need not be ascetics; they should, however, in organizing for public service, prove that one segment of society, peculiarly equipped to lead in this mechanized age, is capable of intelligent, constructive, disciplined self-interest.

Some years ago, American Association of Engineers attempted to popularize the slogan "Ask the Engineer—the Man Who Knows". For the term "engineer" we might well substitute "technologist" or "industrial scientist." The Association tried to induce manufacturers of machinery and materials used in construction of highways and other public works to popularize this slogan in their advertising. We asked them, virtually, to emulate the pharmaceutical industry which never misses an opportunity to advise the public to "consult your doctor" or "visit your dentist twice a year." We implored the industries affiliated with engineering to adjure the public to use the knowledge and judgment of engineers in *planning* public works programs as well as in the design and construction of public works. Our purpose was to induce communities to rely on the advice of engineers as to *what* should be constructed, instead of using that valuable asset only in deciding *how* public works should be constructed.

For the success of a campaign of this kind, there must be, in every community, an organized body of technologists, recognized as a public service agency, *ready* to advise the citizens on technological projects. Technologists in the Chicago Metropolitan District could make the Chicago Technical Societies Council such an agency.

To make the services of technologists available to society in civic affairs, there must be this central agency. It must be one to which all departments of government, all service organizations, all commercial and industrial associations will turn quite naturally for guidance in technological matters. It will be the agency that searches out the resources of the area and points the way to most efficient use of those resources. It will thus be a strong factor in the campaign for "maximum production, full employment." It will collect and disseminate information on new technological developments so that selfish interests may not delay the benefits which society receives in the form of new commodities, services and processes from scientific inventions and discoveries. This body must alertly observe the use of resources to be sure that there is no unnecessary waste of materials, energy or man power. Our Council must be so fair in all its judgments, so unprejudiced in its recommendations, so devoted to the common good, that it will be above suspicion. Through the constituent societies, it must draw upon the intimate knowledge which individual technologists possess because of their connection with great industries and their sincere interest in community affairs. The Council must also utilize the knowledge of sectional and cross-sectional units—the specialized information made available through its constituent groups as that knowledge is brought to bear upon particular problems.

In urging such an integration for public service we are merely seconding the eloquent invitation issued to technologists by Dr. Eisenschiml in the July issue of Sci-En-Tech News when he said that technologists must "come out of the kitchen and sit in at the family table where bigger matters are discussed . . ." and share responsibility with lawyers, bankers, ministers, brokers, columnists, and salesmen. Technologists will wield such influence only when they are as firmly integrated as are doctors, lawyers, dentists, industrialists, and bankers, in an organization able and willing to carry responsibility.

The Public Relations Angle

Dr. Eisenschml deplored the relative obscurity of scientific stars, in comparison with the fame (or notoriety, as the case may be) of stars of the stage and screen. He has suggested that technologists might achieve appreciation of their socially valuable service by participating more actively in civic affairs, if that participation were systematically publicized. No matter how well the unified technological professions may serve society, the day will never dawn when hysterical fans are likely to trample movie stars, professional football and baseball players, crooners and prize fighters in an effort to get the autograph of a top-flight chemist, architect or engineer. Which isn't exactly a blight on the life of technologists. Architects, chemists and engineers want the public to be interested in and understanding of their *work*—not curious about those intimate matters which movie stars ironically call their "private lives". If technologists believed that unified civic service would cause the spyglasses of Louella Parsons, Jimmie Fidler, Hedda Hopper and Walter Winchell to be turned on their private lives, they would dig even deeper into their burrows of technology and insulate themselves even more thoroughly from public affairs and attendant public curiosity.

Nevertheless, Dr. Eisenschiml is right in believing that there is a vital connection between civic service and public relations programs. The public must have confidence in the judgment of technologists before it is willing to accept their leadership. It must know something about the training and actual experience that qualifies technologists for leadership. Technologists must win not only the confidence but the affection of the public before they can give maximum civic service.

For a great many years, American Association of Engineers has systematically studied the picture of technology and technologists that is being presented to the public. The technical press, with its reports of ritualistic recognition of achievement, makes top-drawer scientists look like stuffed shirts. This kind of publicity is seldom read by the laity, and it evokes awe, rather than affection or loyalty among less spectacular technologists. In its advertising, industry boasts of its plants and paten and engineers as if they were chattels and the public may well infer th these technologists are dehumanized instruments of progress. In movie radio and fiction, engineers are glamorized beyond recognition. Th "typical" engineer is as rugged as he is righteous. Galley upon galle reel upon reel, he struggles against infamy and the elements—never le than a spectacular figure, and most of the time colossal. The public b lieves that this is a true picture of engineering and it loves what it ha been led to believe is a "typical" engineer. But this does not mean th the public also loves and admires the flesh and blood engineers, architec and chemists who in their prosaic way furnish the public with its mo essential goods and services, and, day by day, contribute to its securit

Somehow, our Council must show the citizens of Chicago what the own technologists are doing for their neighbors. It must get across th social significance of unspectacular but vital service rendered to societ by inconspicuous but competent engineers, architects and chemists. must make the public understand that these are the *typical* technologist

It is important that people understand technology's part in t scheme of things, in order that they may also understand why the voi of technologists should be authoritative in public councils when tec nological matters are under consideration.

Naturally technology believes that its most brilliant performe should be recognized and honored. It also believes that their very em nence entitles them to authority in public affairs. Both theories have som validity. But both must be qualified. Honor is appropriate; adulation not. There is something very close to snobbishness in the way technolog exalts its most brilliant performers and ignores the supporting cast. Th attitude encourages a belief that only the eminent are "professional"- and the measure of a man's "professionalism" is the degree of eminen he attains. Distinction is regarded as an end in itself.

If, in their humility, inconspicuous technologists, consider them selves not quite professional, they may also believe that they are absolve from the obligations of professional men. Professionalism should b measured by the individual's recognition and acceptance of the soci obligations which membership in a profession imposes, regardless of h rank in its hierarchy. Our Council must make it clear that every man wh has had technological training, largely at the expense of society, and wh is employed in any branch of technology is under obligation to use th training in every possible way for the good of society. It must also mak laymen understand that technologists are subject to such an obligation and further, that the obligation is met not only by participation in civ affairs, but in faithful performance of everyday technological work.

Technologists should honor those architects, chemists and enginee whose achievements deserve recognition, but they should not attempt t

(*Please turn to page* 21)

Atomic Energy[*]

"The U. S. through nuclear research is definitely moving toward full utilization of atomic power for the betterment of American living," stated Dr. E. C. Pollard, Chairman of the Committee on Biophysics at Yale University, at the January 4th meeting of the New Haven YMCA Junior College Chapter of the American Association of Engineers. Dr. Pollard discussed the historical background of atomic energy and the "chain reaction" and the "atomic pile."

Explaining the relationship of nuclear structure to matter in general, Dr. Pollard stated that "all of mass is empty. An atom consists of a small, heavy nucleus surrounded by rotating electrons. The sum total of nucleus and electrons is known as the atom. Nothing exists between the cloud of electrons and the nucleus but space. It is for this reason that the atom which in reality constitutes mass, is said to be 'empty.' "

Many scientists believed the atom to be impenetrable due to the tremendous attraction of the electrons to the nucleus. A few persistent men of science, among them Lawrence, Fermi, Chadwick and Urey, refused, however, to hold with such a belief, and in a few years the atom had been smashed. The same scientists later defied the scientific world to prove that nuclear energy could be harnessed in an "atomic bomb."

Dr. Pollard is one of this group of young "atomic" scientists who grew up with their discovery. Born in Yunnan, China, in 1906, he took his B.A. and Ph.D. at Cambridge University in England. He came to Yale University in 1933 as a Sterling Fellow. During the war, he designed micro-radar equipment in the Radiation Laboratory at the Massachusetts Institute of Technology. At present, as head of the Biophysics committee, he is instituting a broad and novel attack on the basic physical nature of life as exemplified in the organic cell. In addition, Dr. Pollard is directing research in nuclear studies.

With this broad background in nuclear fission, Dr. Pollard spoke authoritatively on aspects of the "chain reaction" and the "atomic pile." He demonstrated the enormous energy released by atomic reaction in stating that a drop of radio-active substance the size of a pinhead could kill at fifty yards. "Fortunately," reassured Dr. Pollard, "this radio-activity disintegrates rapidly upon release from the atomic 'furnace.' "

He lauded the development of protective devices in the field of nuclear research and stated that a greater number of scientists would have lost their lives had not these devices been available.

In conclusion, Dr. Pollard spoke of the shift in emphasis throughout the western world from the utilization of atomic power as a destructive force for war, to the harnessing of nuclear energy as a generating power for industry. The results of such studies remain to be determined.

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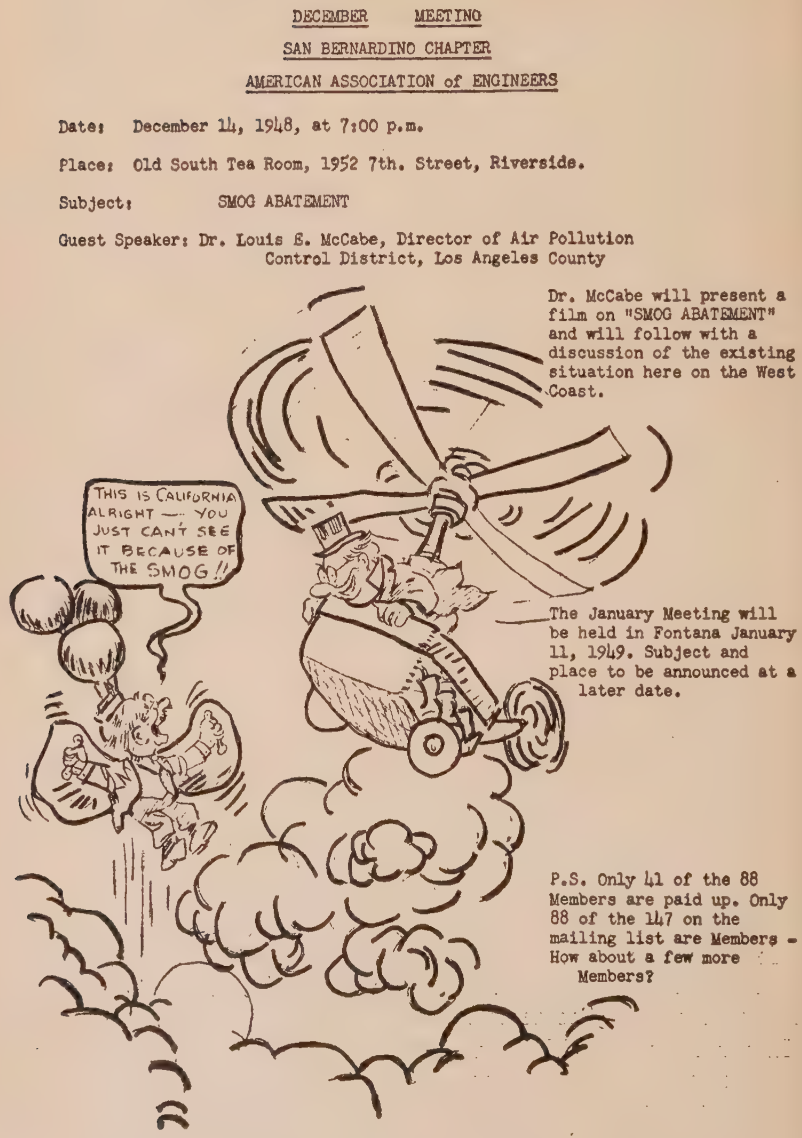
[*] Excerpts from address by Dr. E. C. Pollard, delivered before a meeting of the New Haven Y.M.C.A. Chapter, American Association of Engineers, prepared by one of the student members

CHAPTER NOTES



DECEMBER MEETING
SAN BERNARDINO CHAPTER
AMERICAN ASSOCIATION of ENGINEERS

Date: December 14, 1948, at 7:00 p.m.

Place: Old South Tea Room, 1952 7th. Street, Riverside.

Subject: SMOG ABATEMENT

Guest Speaker: Dr. Louis E. McCabe, Director of Air Pollution Control District, Los Angeles County

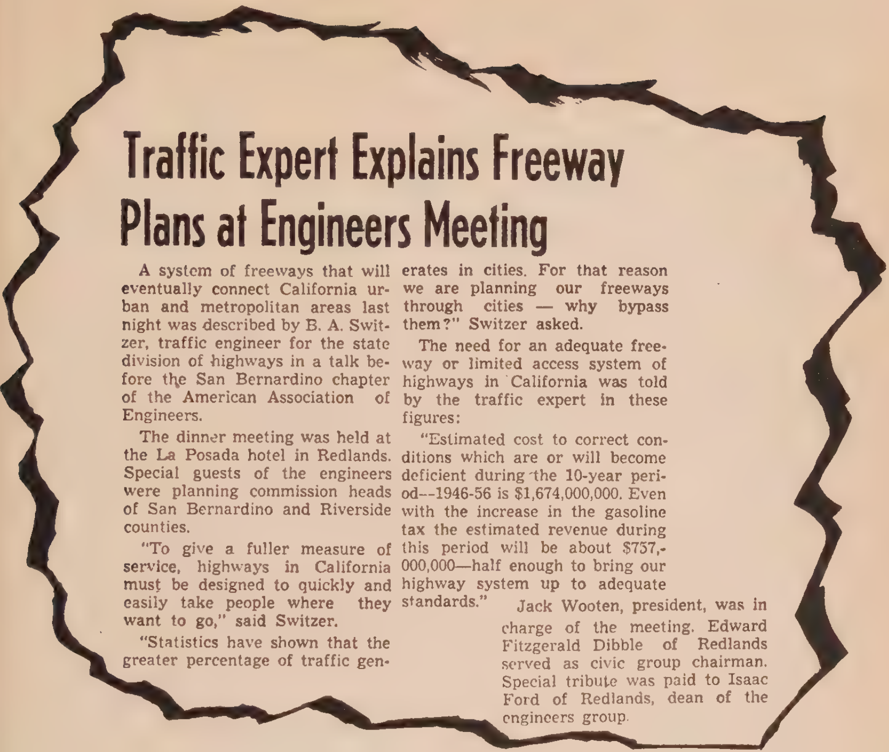
Dr. McCabe will present a film on "SMOG ABATEMENT" and will follow with a discussion of the existing situation here on the West Coast.

The January Meeting will be held in Fontana January 11, 1949. Subject and place to be announced at a later date.

P.S. Only 41 of the 88 Members are paid up. Only 88 of the 147 on the mailing list are Members - How about a few more Members?

THIS IS CALIFORNIA ALRIGHT — YOU JUST CAN'T SEE IT BECAUSE OF THE SMOG!!

An attractive way to announce chapter meetings



Traffic Expert Explains Freeway Plans at Engineers Meeting

A system of freeways that will eventually connect California urban and metropolitan areas last night was described by B. A. Switzer, traffic engineer for the state division of highways in a talk before the San Bernardino chapter of the American Association of Engineers.

The dinner meeting was held at the La Posada hotel in Redlands. Special guests of the engineers were planning commission heads of San Bernardino and Riverside counties.

"To give a fuller measure of service, highways in California must be designed to quickly and easily take people where they want to go," said Switzer.

"Statistics have shown that the greater percentage of traffic generates in cities. For that reason we are planning our freeways through cities — why bypass them?" Switzer asked.

The need for an adequate freeway or limited access system of highways in California was told by the traffic expert in these figures:

"Estimated cost to correct conditions which are or will become deficient during the 10-year period--1946-56 is $1,674,000,000. Even with the increase in the gasoline tax the estimated revenue during this period will be about $757,000,000—half enough to bring our highway system up to adequate standards."

Jack Wooten, president, was in charge of the meeting. Edward Fitzgerald Dibble of Redlands served as civic group chairman. Special tribute was paid to Isaac Ford of Redlands, dean of the engineers group.

San Bernardino

The January meeting of the Chapter was held at the Kaiser Cafeteria, Fontana, with 41 members and guests present. President Wootan presided. At the February meeting, the engineers enjoyed an illustrated talk on Rail Steel for Reinforcement.

Announcements of Chapter meetings are in rather attractive mimeographed form, and unusual cartoons are used as attention-getters.

One of the objectives of the Chapter for 1949 is to encourage members of A.A.E. student branches at Riverside College, San Bernardino, and the University of Redlands to attend their meetings. M. A. Woods, John Jahn, and W. H. Stockley constitute the Fellowship Committee, and G. W. Burgess and the City Group Chairmen, B. W. Shaw, J. M. Hood and D. Bergelis, the Membership Committee.

Long Beach

At the January 20 Chapter meeting, special technical films of Saudi-Arabia were shown by Mr. Green of the Standard Oil Company.

A new Civic Committee was announced at that meeting, consisting of Sheldon Steele, James Dean, Ernest Caldwell, George Roalfe, Chas. P. Morgan, V. Hedden and D. Erb.

The Chapter was complimented for its prompt action in regard to the hiring of an architect by the city.

At the February 17 meeting Mr. Williams of the Colorado River Authority gave a talk on the present status of the water supply to Southern California, stressing the need of the Chapter's supporting the Metropolitan Water District and the Colorado River Authority in their stand for California's full share in Colorado River water.

The March 17 meeting was held at

Vernon's Men's Grill. Dinner served at 6:30. Ed O'Connor was the Program Chairman. Richard Weisman of The Bethlehem Steel Corporation showed films on the construction of the San Francisco Bay Bridge.

We are glad to see the Chapter so vitally interested in civic affairs.

North Idaho Junior

"On April 20," writes Vice President Steiner, "our chapter members were the guests of the Washington Water Power Co. We visited the office of the dispatcher for the North West Power Pool at Spokane. After its operations were explained, we visited the Company's plant at Long Lake and were shown through it. Here we were served an excellent meal and then taken through another plant a few miles down the river.

"On April 28, the Engineers' Club sponsored the annual Engineers' Ball, a semi-formal dance."

Good wishes to all of you, and many thanks for your fine cooperation.

Bakersfield College

Bakersfield Student Chapter Officers for 1949 are as follows:

President, Richard Chappelle; Vice President, Howard Miller; Secretary, James Miller; Treasurer, Gordon Wiley; Sgt.-at-arms, Anthony Rice; Adviser, E. M. Hemmerling.

The Chapter has held some interesting meetings, including field trips, inspection trips, etc., during the past few months.

"We believe our club is well worth belonging to," writes Secretary James Miller to the National Secretary. "Our meetings are well attended and we have many activities. Besides using the club as a means of recreation and social entertainment we also participate in useful and educational activities. We sponsor movies every other Thursday which deals with some phase of engineering. There are many plants or projects in this vicinity that are interesting to future engineers. We have toured the site where Standard Oil is constructing a new refinery and we were escorted through a new steam power plant that was constructed recently by the Pacific Gas and Electric Company."

Thanks, Mr. Miller, and lots of luck and good wishes to all our young engineers at Bakersfield. We hope you will always be actively interested in your engineering societies, and that some day one or more of your members will be national leaders of A.A.E.

Gilbert Hogue Honored

Gilbert H. Hogue, formerly with the U. S. Reclamation Bureau, and now engineer for the Lindmore Irrigation District, California, was given an "Honor Award" for 44 years of service with the Bureau at its luncheon meeting held at the Mt. Whitney, Lindsay, on March 1.

Jack W. Rodner of Fresno, manager of the Tulare Basin District, Bureau of Reclamation, presented the scroll which was awarded for Mr. Hogue's "commendable service" which started in 1902 when he was employed with the U. S. Geological Survey.

After the luncheon, at which Mr. Hogue presided, a contract was signed between the local irrigation district and the United States Government providing for a 4½ million dollar water distribution system for the Lindmore Irrigation District, serving 27,500 Lindsay-Strathmore acres. Included in the agreement are some 55,000 acre feet of water to be put in the district's mains from the Friant-Kern canal. The cost will be repaid, without interest, in 40 equal yearly instalments.

Mr. Hogue has been a member of the American Association of Engineers since 1919.

The advantage of reasonable unanimity in developing projects should be recognized. Logical discussion should be courted, not squelched.

Benny, small aristocrat,
  Bit the dentist
Think of that!
  Dentist in a foaming rage,
Disclaimed further patronage.

Women IN ENGINEERING

Among the top five students in the College of Engineering, University of Colorado, Class of 1948, was one young lady, Miss Phyllis Ann Fox of Denver. She is the first woman engineer from the University of Colorado to be awarded a graduate scholarship at Massachusetts Institute of Technology, where she is now studying. Miss Fox had the third highest average in the College of Engineering last June, and the second highest in the Electrical Engineering Department, with a score of 2.961.

PHYLLIS ANN FOX OF DENVER
Engineering graduate, University of Colorado, now a student at Massachusetts Institute of Technology

MISS ELSIE EAVES
a 1920 Engineering Graduate, the University of Colorado

Elsie Eaves, a 1920 graduate of the College of Engineering has the distinction of being the only woman ever elected to a corporate membership in the American Society of Civil Engineers. She is rated as "indispensable" in her administrative position on the Engineering News-Record and Construction Methods, engineering publications. Manager of business news and director of marketing surveys, she handles vast sources of information about construction on a national basis.

Now Available!

TRADE-MARKS

H. BENNETT

Technical Director, Glyco Products Co., Inc.

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Trade Marks, by H. Bennett, F.A.I.C. Technical Director, Glyco Products Company, Inc. Chemical Publishing Co. $10.00.

A timely book written by an expert. Trade Marks sometimes spell success or failure in the marketing of a new product. The author has covered this important subject in a manner which leaves nothing to be desired. The legal aspects are dealt with in readily understandable language. The chapter "Coining of Trade Marks" is alone worth the price of the book. The chapter "Trade-Mark Dictionaries" is noteworthy since it covers among other things alphabetical lists of trade-marks, trade-mark owners and the composition of trade-mark products. There is a "Name Finder" gadget enclosed which is a great timesaver. A must book for industry.

Cybernetics, by Norbert Wiener, Professor of Mathematics the Massachusetts Institute of Technology. John Wiley & Sons, Inc. $3.00.

The book of the year. A thought provoking but rather difficult book since it covers a new science. A knowledge of higher mathematics is definitely required. The author and his associates have studied human control functions and designed a mechanico-electrical system to replace them. This book opens up a field of tremendous possibilities, it is revolutionary in many respects but points the way to better understanding of the human brain and the nervous system.

Theory of Modern Steel Structures, Revised Edition, by Linton E. Grinter, Ph.D., C.E., Research Professor of Civil Engineering and Mechanics, Illinois Institute of Technology. The MacMillan Co. $5.25.

The new edition has been greatly improved and should be in the library of every structural engineer. The author's professional standing earmarks the book.

Field Engineering, by Searles, Ives and Kissam, 22nd Edition. $6.50 for the two volumes, text and tables combined. Text and Tables respectively may be had for $3.75 each.

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Examination and Valuation of Mineral Property, Baxter and Parks. Third Edition by Roland D. Parks. $5.00. Addison-Wesley Press, Inc.

This reviewer has used this book in his practice and can therefore recommend it to all engineers having to do with mineral properties.

The new edition contains a section on oil property valuation by Walter L. Whitehead, Associate Professor of Geology, Massachusetts Institute of Technology. The Michigan Mine Appraisal System is described in another chapter by Frank G. Pardee, Mining Engineer and Appraiser of Mines, Michigan Geological Survey, Lansing, Michigan. The author who is Associate Professor of Mineral Industry at Massachusetts Institute of Technology, has done an outstanding job in providing in one com-

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pact volume a real tool for mining engineers and geologists.

Higher-Polymer Physics. A symposium Edited by Howard A. Robinson, Manager, Physical Research, Research Laboratories, Armstrong Cork Company, Lancaster, Pennsylvania. Published under the Auspices of the American Institute of Physics. Remsen Press Division, Chemical Publishing Co., Inc. $12.00.

High-Polymer Physics are not new, in fact the first work on the subject dates back almost one hundred years or more. The symposium covers the field to an extraordinary degree, nothing seems to have been overlooked, the various contributors, all outstanding in their respective field, have brought together in one volume a mass of information much of which should prove both helpful and important to the plastic industries. The book is a must for chemical and industrial libraries.

Mathematics at Work, by Holbrook L. Horton. First Edition. $6.00. The Industrial Press.

This book is just what machine designers, draftsmen, etc., needed. To begin with the author has written an excellent refresher course in mathematics; secondly, he has given engineers, designers and others just the right information needed in their daily work. The book is replete with all kinds of information. Chapters 22-23-24 are especially useful. Chapter 27 "Mathematical Tables" is of real help. Definitely a must book for engineers and designers.

Bob Clifton, Elephant Hunter, by Dock Hogue. Henry Holt & Company. $2.50.

This book is written by a member of the American Association of Engineers, who has had considerable experience in Africa. The work contains some fine illustrations by Kurt Wiese. Anyone interested in big game hunting in the African Congo will enjoy this author's story. The book is written by a man of experience. We are proud of our members and hope that he will write other books covering his experience in and understanding of Africa.

Computation Curves for Compressible Fluid Problems. By C. L. Dailey, Research Engineer University of Southern California, and F. C. Wood, Research Engineer University of Southern California. $2.00. John Wiley & Sons, Inc.

The book contains a number of tables together with descriptive text which should prove of great value to engineers and others having to do with compressible fluids. The text is well done and the book fills a decided need since very little information is available on this subject even in text books.

Design of Steel Buildings, by Harold D. Hauf, M.S., Professor of Architectural Engineering, Yale University, and Henry A. Pfisterer, Associate Professor of Architectural Engineering Yale University. Third Edition. $5.00. John Wiley & Sons, Inc.

A well written book for structural engineers and especially for students. The book deals in the main with larger buildings and has been revised in conformity with the various practice recommendations and standards of today. A good book for students and also very useful for engineers.

Service Is My Business, published by Rotary International, Chicago, Ill.

This book is the Credo of Rotary and therefore deserves wide reading. A most interesting and thought provoking book.

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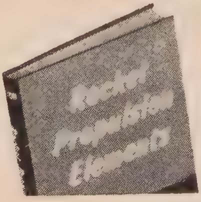

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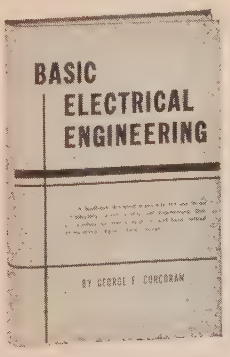

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Handbook of Chemistry and Physics. Thirty-first Edition. Charles D. Hodgman, M.S., Editor-in-Chief. Chemical Rubber Publishing Co. $6.00.

The most important reference book in its field containing 2,737 pages of up-to-date material. The handbook is so well known that the mere fact the book is now in its 31st edition demonstrates its usefulness beyond a doubt. Some 180 pages of new material have been added.

Heating, Ventilating, Air Conditioning Guide 1949. Volume 27. American Society of Heating and Ventilating Engineers. $7.50.

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The Way Ahead is an extremely attractive magazine (Vol. I, No. 1 published in the autumn of 1947) dealing with the Netherlands En Route to Reconstruction. Its publisher is the Society "Stiching Bouw," the Hague, Holland. The subscription rate is $1.00 a copy, $3.00 a year. It is written in English and directed particularly to American industry and to professional personnel.

American Iron and Steel Institute, 350 Fifth Avenue, New York. Three new studies, in the Steel Products Manual series. Pig Iron and Ferroalloys, Section 1; Tie Plate Designs and Punchings, Section 3; Alloy Steel Plates, Section 7. Three new supplements to earlier studies, one each for Standard Carbon Steels, Flat Rolled Electrical Steel (Sec. 26), Hot Rolled Alloy Steels (Sec. 10).

Technologists' Opportunity

(*Continued from page* 8)

delegate all their civic duties and all their authority to these star performers. Technologists should not expect society to accept the dicta of its eminent men simply because they are eminent. That they do is apparent in testimony given to a Congressional Committee by one of the presidents of the National Academy of Sciences. This very eminent man explained that the Academy never, as an organization, attempted to influence public opinion; nor was it, he explained, authorized to initiate technological projects. Its function is to advise Congress and executive agencies on scientific matters, privately, when it is requested to do so. He said that the Academy had voluntarily limited membership to 450 but that it had never, at any one time, numbered more than 350—so exacting are its standards. This, said the president of the Academy, restricted the agency to men of supreme distinction in their several fields, and he said with great satisfaction, that the Academy therefore enjoyed the greatest authority in the world—"the authority of distinction without power."

This extremely interesting statement was made at a time when the nation had just become involved in a world war and was facing dismaying shortages in all manner of essential materials and while government agencies were frantically seeking new sources of supply and improvising substitutes. The statement of the president of the Academy would seem to mean either that the members sanctioned the pre-war policies which had caused the shortages, or that for all their double-distilled distinction (without power) they had not exercised the special kind of authority necessary to change those policies before a crisis arose.

The theory doesn't stand up. Distinction and the ability back of it entitles technology's eminent men to lead, but their authority depends upon the support of organized masses of technically trained men who can, following these leaders, inform the public and bring pressure to bear when it is needed to insure adoption of wise policies. Technology's leaders in the National Academy of Sciences are generals without an army. Exactly the same situation exists in community affairs, unless masses of technically trained men are organized in such an agency as our Council ready to serve in any emergency. They must be intelligently and unselfishly interested in public affairs. They must also, as we have said before, have the confidence of the public.

To gain that confidence the Council must formulate a program which will insure public understanding of the contribution made to social welfare by technologists in their daily activities. It must make the public aware also of the achievements of Chicago's most brilliant technologists —but it must emphasize the social significance of those achievements That sort of story seldom emanates from technical society headquarters

Some years ago Los Angeles newspapers carried this headline: *Engineers Devise New Method ofTriangulation allowing finest shade of accuracy in calculations for new Metropolitan Aqueduct.* That story should have been captioned: *Public Health and Property Values Benefitted by New Engineering Technique.* In the first place people are more inclined to read a story which reports benefits to their health or property; in the second place having read it, they are more likely to feel a glow of gratitude for such benefits than to be overcome with admiration for a new technique. Only in soap operas and movies is "triangulation" an attention-getting device Which of the following headlines would the medical profession prefer "Surgeons Dissect 50 Cadavers to Perfect New Surgical Method Enabling Them To Perform Extremely Delicate Brain Operation With Finest Shade of Accuracy" or "New Hope for Thousands of Sufferers from Brain Diseases Results From Recently Perfected Surgical Technique"? Our Council must tell people, in language that they can understand, what technologists are doing and what more they are capable of doing to insure adoption of sound technological policies and programs by private and public agencies.

Though the Council technologists must insist that the scientific rule "Get the Facts" and its corrolary "Be Governed by the Facts" (rather than by expediency or pressure) prevail in planning the technological activities of Metropolitan Chicago. The Council must induce citizens to demand that competent technologists be placed in charge of all great technological projects. Through the Council these men must have the organized support of all Chicago technologists. Thus, functioning in peace, technologists will hold themselves ready to give extraordinary service when a crisis arises as they were not ready to serve when World War II began and they stumbled through the rather awkward procedures which at last brought the Chicago Technical Societies Council into existence as a permanent agency for integration of their civic efforts.

A.A.E.'s Scoreboard

Difficulties encountered here, when technologists, without advance organization, tried to unify quickly for public service, are probably characteristic of conditions in nearly all the large cities of the United States. Certainly that is the impression that American Association of Engineers got when it surveyed the individual and group civic activities of technologists throughout the nation.* The Association dispatched a questionnaire to chambers of commerce in all types of cities in all sections of the United States asking these three questions:

1. Is your community getting full value from its Engineer Citizens acting in groups? (With specific questions regarding civic activities of local engine ring clubs and societies.)

2. Is your community getting full value from its Engineer Citizens individually? (Are engineers among the ten citizens considered outstanding in civic service?)

3. Does your community, your county, your state, use its Engineers intelligently and fully? (i.e., Are they represented on boards and commissions that *plan* public works, improvements, etc.?)

Fifty-seven percent of the agencies queried answered the questions more or less completely; 18% replied in a letter commending engineers in general for effective civic services; 6% replied by letter commenting generally but unfavorably on the civic activities and attitude of engines. Although the comment applied directly to this one branch of technology, it probably follows rather closely the prevailing estimate of civic service rendered by architects and chemists and other industrial scientists.

No engineering club was reported to hold a membership in any chamber of commerce at that time. Only 20% of the clubs listed in replies were represented by individual members in chambers of commerce, and only 15% of the replies clearly affirmed that engineers, serving on chamber of commerce committees, helped to plan or initiate campaigns sponsored by these organizations, while 18% replied to this question with a flat negative. Thirteen percent of the replies said that engineering organizations themselves originated civic projects, and 21% said that engineering clubs of their communities never took the initiative. Only 10% were positive that engineers greatly influenced the public's opinion of technological projects, and 22% said they were notably deficient in this quality.

With regard to the civic role played by individual engineers, 25% said that engineers were outstanding in civic affairs; 5% accorded limited recognition; 19% said flatly that engineers had not been particularly useful or active beyond the line of duty; 51% ducked this question. Some of the replies were extremely forthright, as for example:

"As a group, it is my considered judgment that engineers are not good citizens. Of course, they usually pay their bills and I presume that most of them don't beat their wives, and some of them may even go to

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*Findings published in PROFESSIONAL ENGINEER, December 1939.

Church on Sunday, but so far as I am able to ascertain, about 90% of them put nothing into the community."

Counteracting this adverse judgment there was equally forthright praise. Far too many replies said that "engineers serve when asked." Thirty-one percent said that they would list engineers among the ten most useful citizens of their communities.

Virtually apologizing for engineers' derelictions many replied that engineers had difficulty in interpreting their work in terms understandable by the laity. Two other popular notions with regard to engineering traits and temperament are found in these quotations:

"As a group they know litle about give and take; each man thinks there is *one* way to do it."

"It seems that the training and experience of engineers are such they have difficulty in making the necessary compromises which come from group action."

"Enginers as a class usually need a course in public speaking plus a good innoculation of civic interest. There are outstanding exceptions and when engineers once get started they are *good.*"

"Generally speaking, the engineer as an individual is so occupied with problems before him and is also too modest and retiring to take much of an active part in civic affairs."

Community leaders are charitable when they attribute engineers' apathy in civic affairs to a virtual monasticism. This indulgence is not conducive to full and efficient use of technical knowledge, skill and judgment. Even though their inertia in civic affairs is condoned, technologists are penalized. If engineers, architects and chemists identified themselves as a social "bloc" by forming a single powerful organization, dedicated to civic service, they could insure full and beneficent use of technology in the interest of society. On a world scale, they could prevent perversion of science to destructive ends. Nuclear energy, for example, if constructively use, may be one of the forces that amazingly expedites the march of civilization—at least in a material way. If the scientists who have uncovered these secrets are impotent to control the use of nuclear energy, it may be the force destined to destroy civilization, both material and spiritual. Biologists, chemists and physicians, have thus far, in their study of germs, been governed by humanitarian purposes. Will they permit their achievements to be used for destructive ends? Or have they an organization strong enough to resist policies and procedures which contravene their professional vows? Technologists need world wide organization in order to prevent destructive use of their inventions and discoveries. That kind of organization must begin somewhere. Chicago technologists can perform an invaluable service by demonstrating in the Chicago Technical Societies Council that technologists can integrate to safeguard professional principles and to serve their community and the nation.